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ABSTRACT

An embodiment of the instant invention is a method of forming a dielectric layer on a silicon-containing structure, the method comprising the steps of: providing a nitrogen-containing gas; heating the silicon-containing structure to an elevated temperature which is greater than 700C; and striking a plasma above the silicon-containing structure, wherein combination of the nitrogen-containing gas, the elevated temperature, and the plasma resulting in the thermal nitridation of a portion of the silicon-containing structure. Preferably, the elevated temperature is greater than 900C (more preferably the elevated temperature is greater than 1000C). The silicon-containing structure is, preferably, a silicon substrate or a bottom electrode of a storage capacitor of a memory device.